CHAPTER 2

DESCRIPTION OF THE LAKE BARKLEY WATERSHED

2.1. BACKGROUND. Lake Barkley is the westernmost U.S. Army Corp of Engineers project in a series of dams along the Cumberland River, and is surrounded by 1,004 miles of shoreline. Lake Barkley was named for former Vice-President Alben Barkley. Land Between the Lakes (US Forest Service) and Fort Donelson National Military Park are on Lake Barkley's western shore.

This Chapter describes the location and characteristics of the Tennessee portion of the Lake Barkley Watershed.

2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location. The Lake Barkley Watershed is located in the northwestern section of Middle Tennessee and includes parts of Cheatham, Dickson, Houston, Montgomery, Robertson, and Stewart Counties.

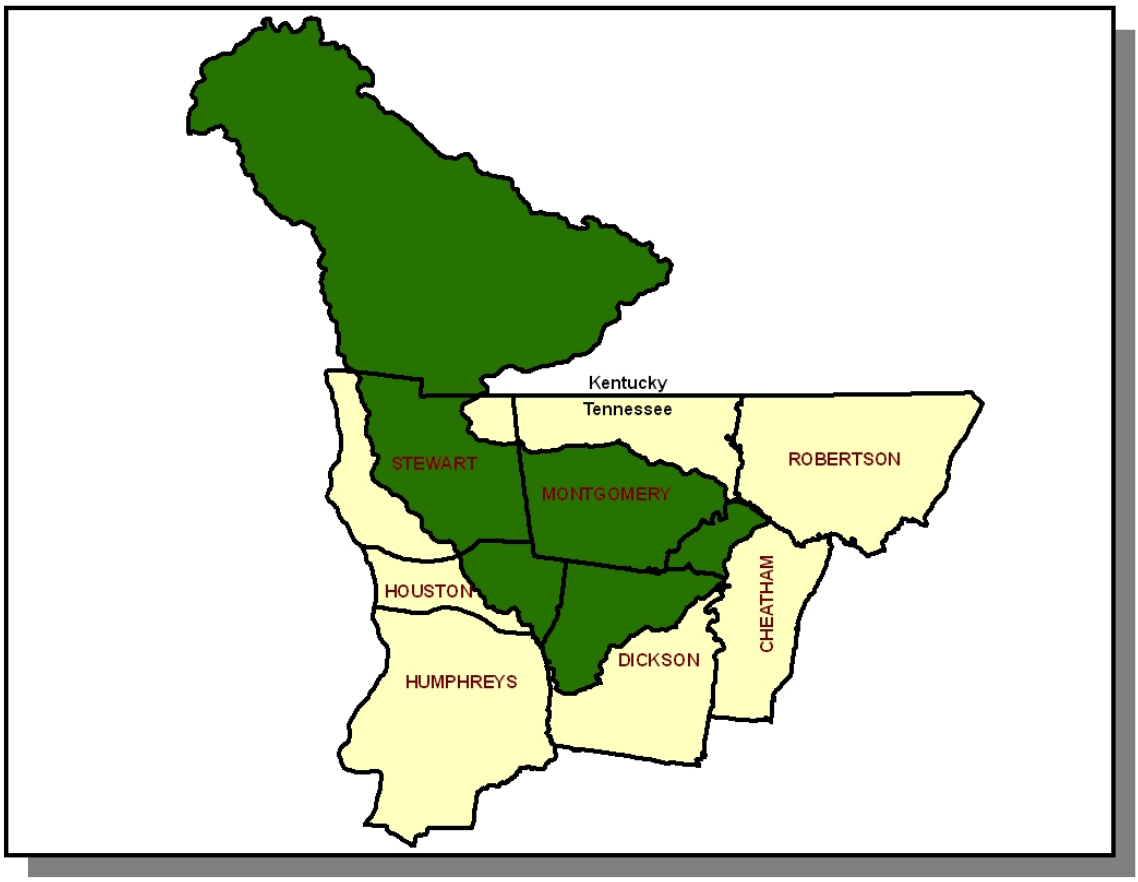

Figure 2-1. General Location of the Lake Barkley Watershed.

COUNTY	% OF WATERSHED IN EACH COUNTY
Montgomery	31.52
Stewart	31.29
Dickson	20.29
Houston	10.74
Cheatham	6.11
Robertson	0.05

Table 2-1. The Tennessee Portion of the Lake Barkley Watershed Includes Parts of Six Middle Tennessee Counties.

2.2.B. Population Density Centers. Twelve highways serve the major communities in the Tennessee Portion of the Lake Barkley Watershed.

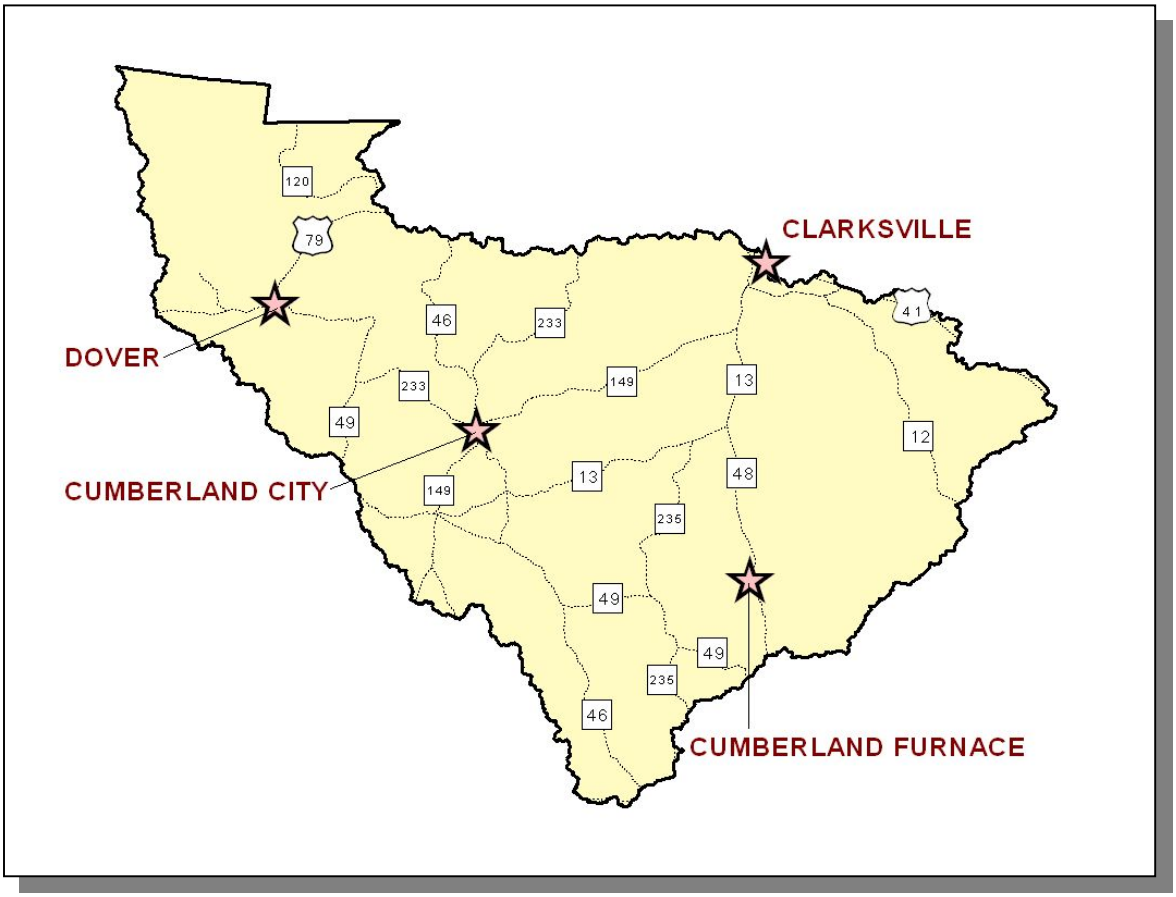

Figure 2-2. Communities and Roads in the Tennessee Portion of the Lake Barkley Watershed.

MUNICIPALITY	POPULATION	COUNTY
Clarksville*	103,455	Montgomery
Dover*	1442	Stewart
Cumberland City	316	Stewart
Cumberland Furnace	150	Stewart

Table 2-2. Municipalities in the Tennessee Portion of the Lake Barkley Watershed. *Population based on 2000 census (Tennessee Blue Book) or http://www.hometownlocator.com. Asterisk (*) indicates county seat.*

2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Lake Barkley Watershed, designated 05130205 by the USGS, is approximately 2,343 square miles (982 square miles in Tennessee) and drains to the Cumberland River.

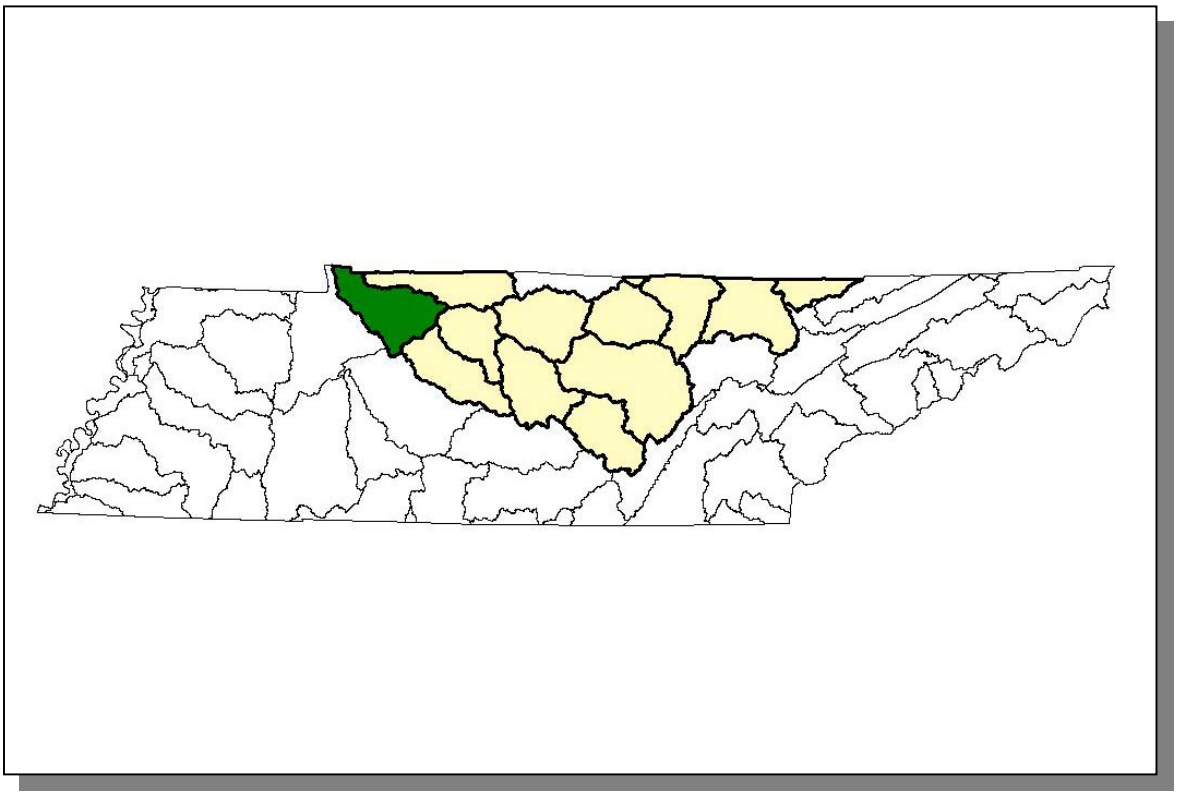

Figure 2-3. The Lake Barkley Watershed is Part of the Cumberland River Basin.

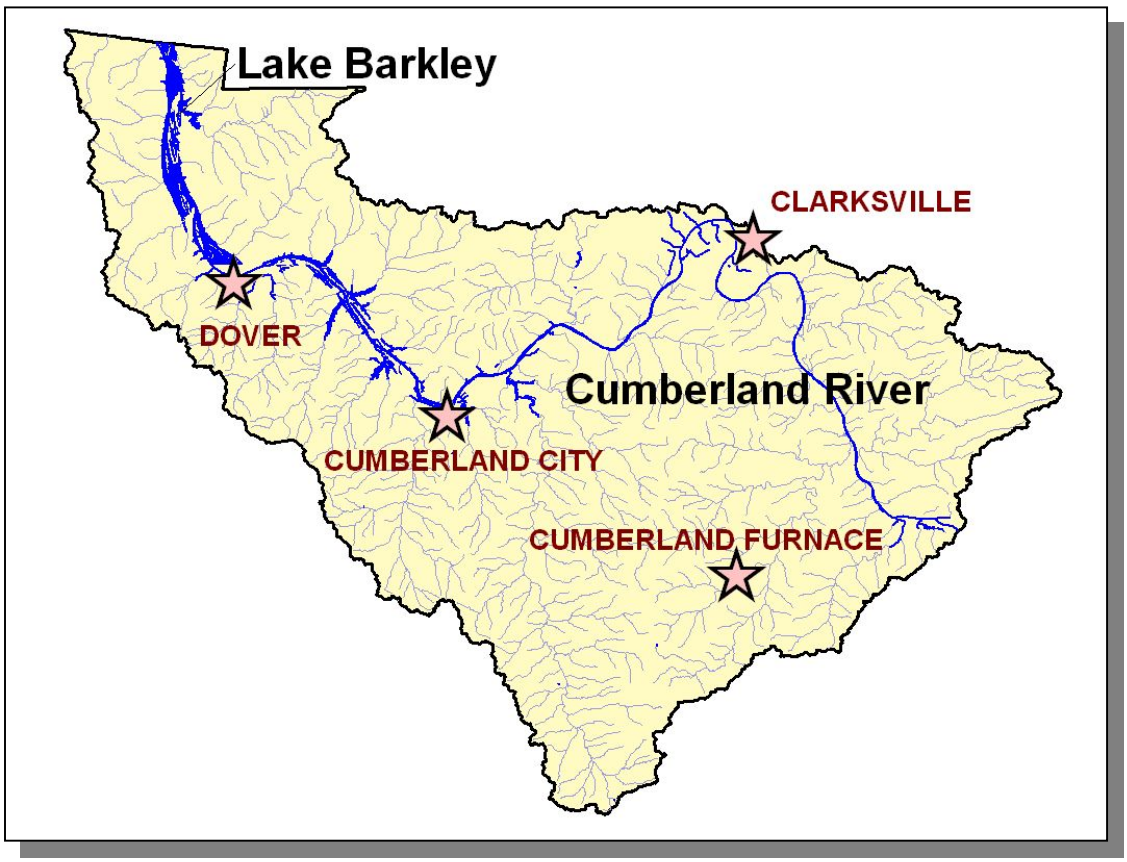

Figure 2-4. Hydrology in the Tennessee Portion of the Lake Barkley Watershed. *There are 1,258.4 stream miles and 37,000 lake acres recorded in River Reach File 3 in the Tennessee Portion of the Lake Barkley Watershed. Location of the Cumberland River including Lake Barkley, and the cities of Clarksville, Cumberland City, Cumberland Furnace, and Dover are shown for reference.*

2.3.B. Dams. There are 9 dams inventoried by TDEC Division of Water Supply in the Tennessee Portion of the Lake Barkley Watershed. These dams either retain 30 acre-feet of water or have structures at least 20 feet high.

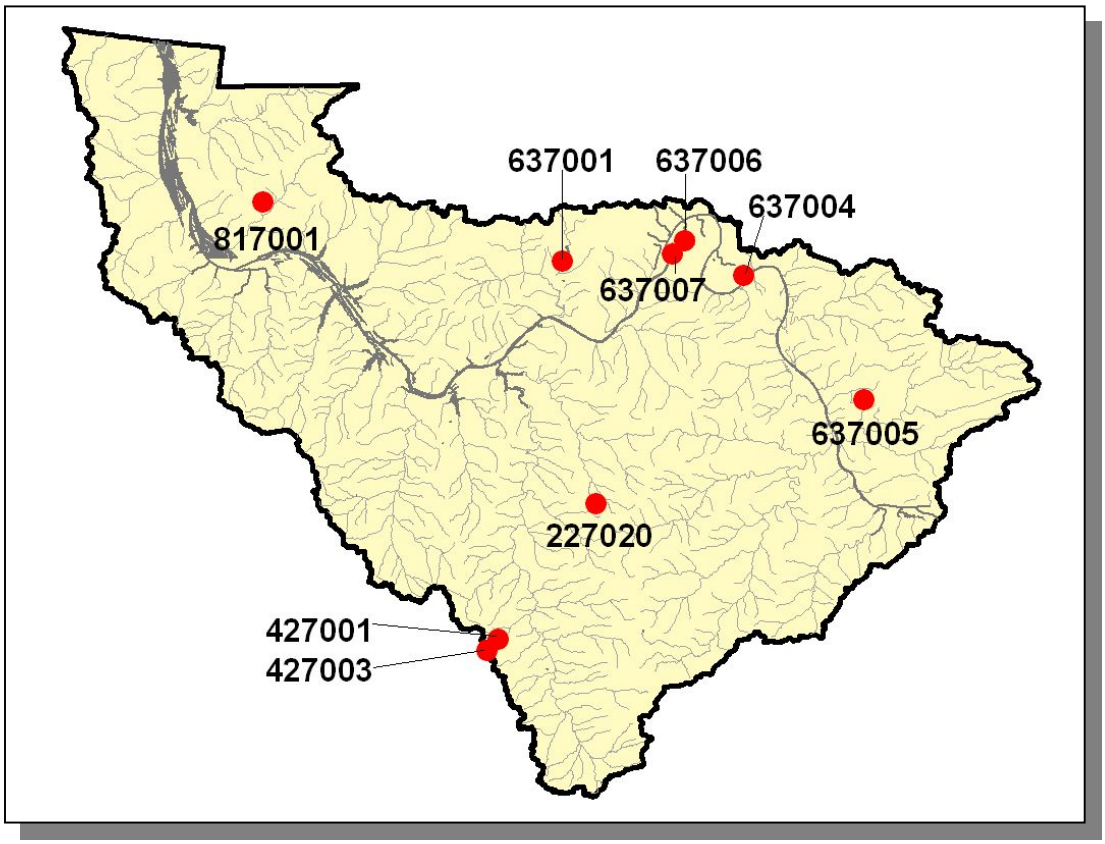

Figure 2-5. Location of Inventoried Dams in the Tennessee Portion of the Lake Barkley Watershed. *More information, including identification of inventoried dams labeled, is provided in Appendix II and at http://gwidc.memphis.edu/website/dams/viewer.htm.*

2.4. LAND USE. Land Use/Land Cover information was provided by EPA Region 4 and was interpreted from 2001 Multi-Resolution Land Cover (MRLC) satellite imagery.

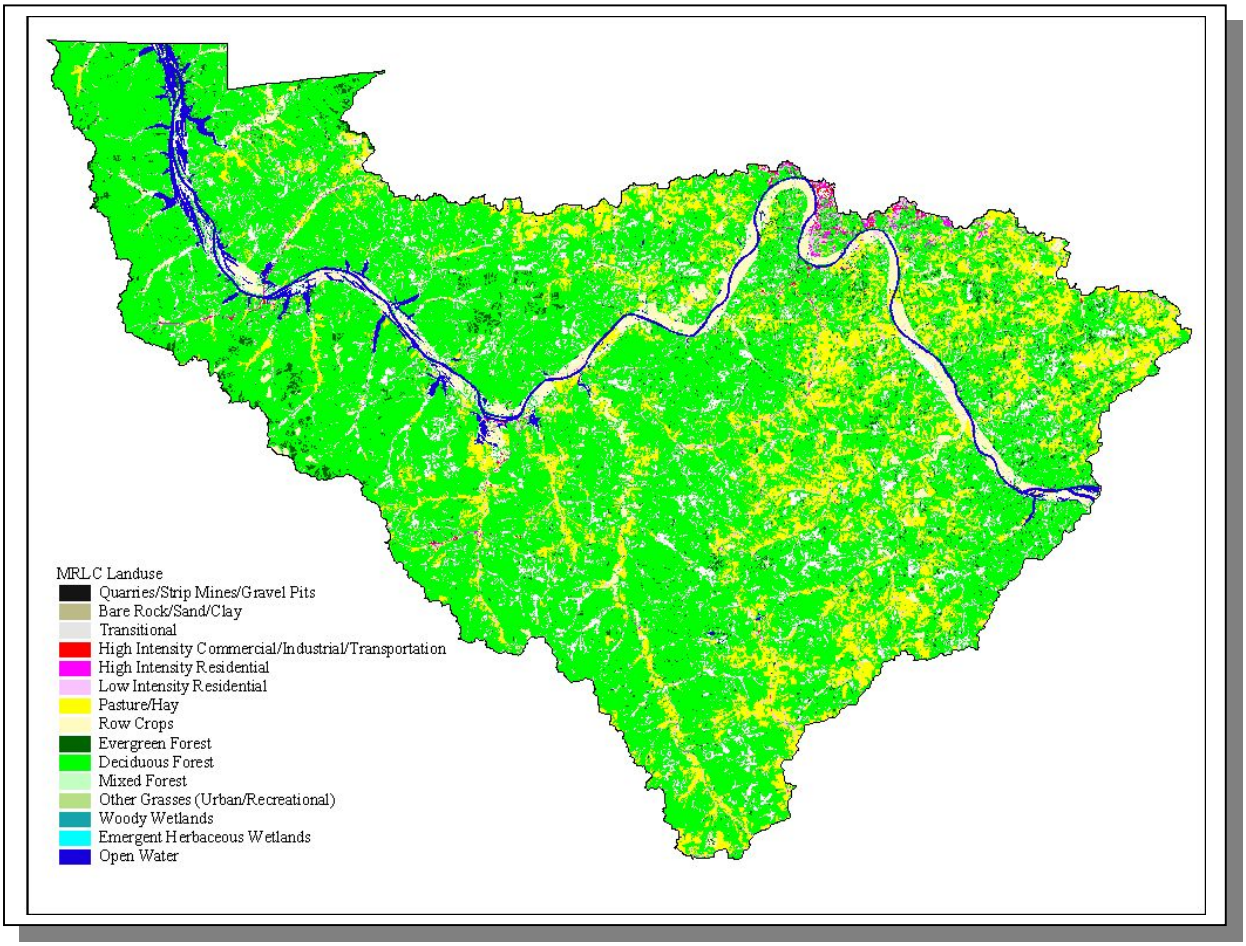

Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.

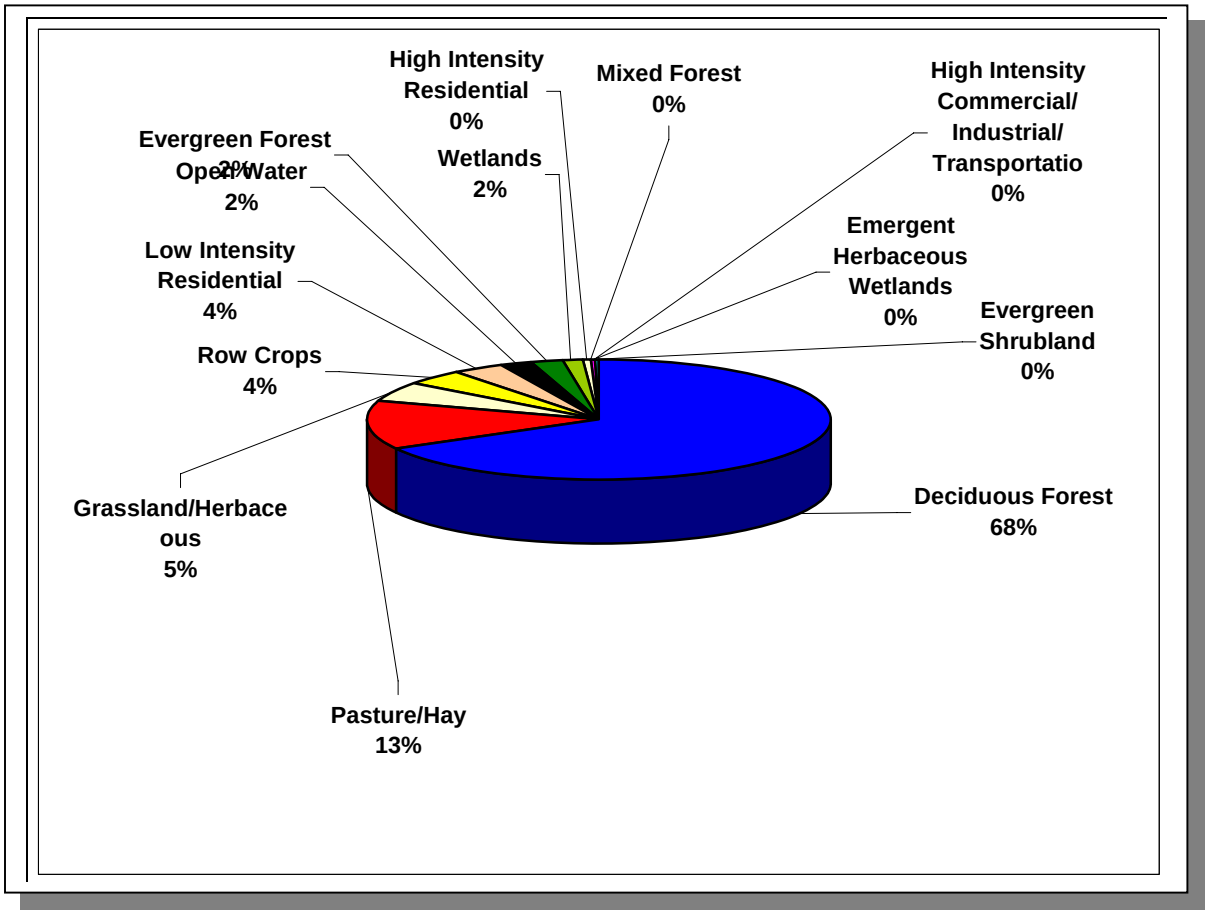

Figure 2-7. Land Use Distribution in the Tennessee Portion of the Lake Barkley Watershed.
More information is provided in Appendix II.

Sinkholes, springs, disappearing streams and caves characterize karst topography. The term "karst" describes a distinctive landform that indicates dissolution of underlying soluble rocks by surface water or ground water. Although commonly associated with limestone and dolomite (carbonate rocks), other highly soluble rocks such as gypsum and rock salt can be sculpted into karst terrain. In karst areas, the ground water flows through solution-enlarged channels, bedding planes and microfractures within the rock. The characteristic landforms of karst regions are: closed depressions of various size and arrangement; disrupted surface drainage; and caves and underground drainage systems. The term "karst" is named after a famous region in the former country of Yugoslavia.

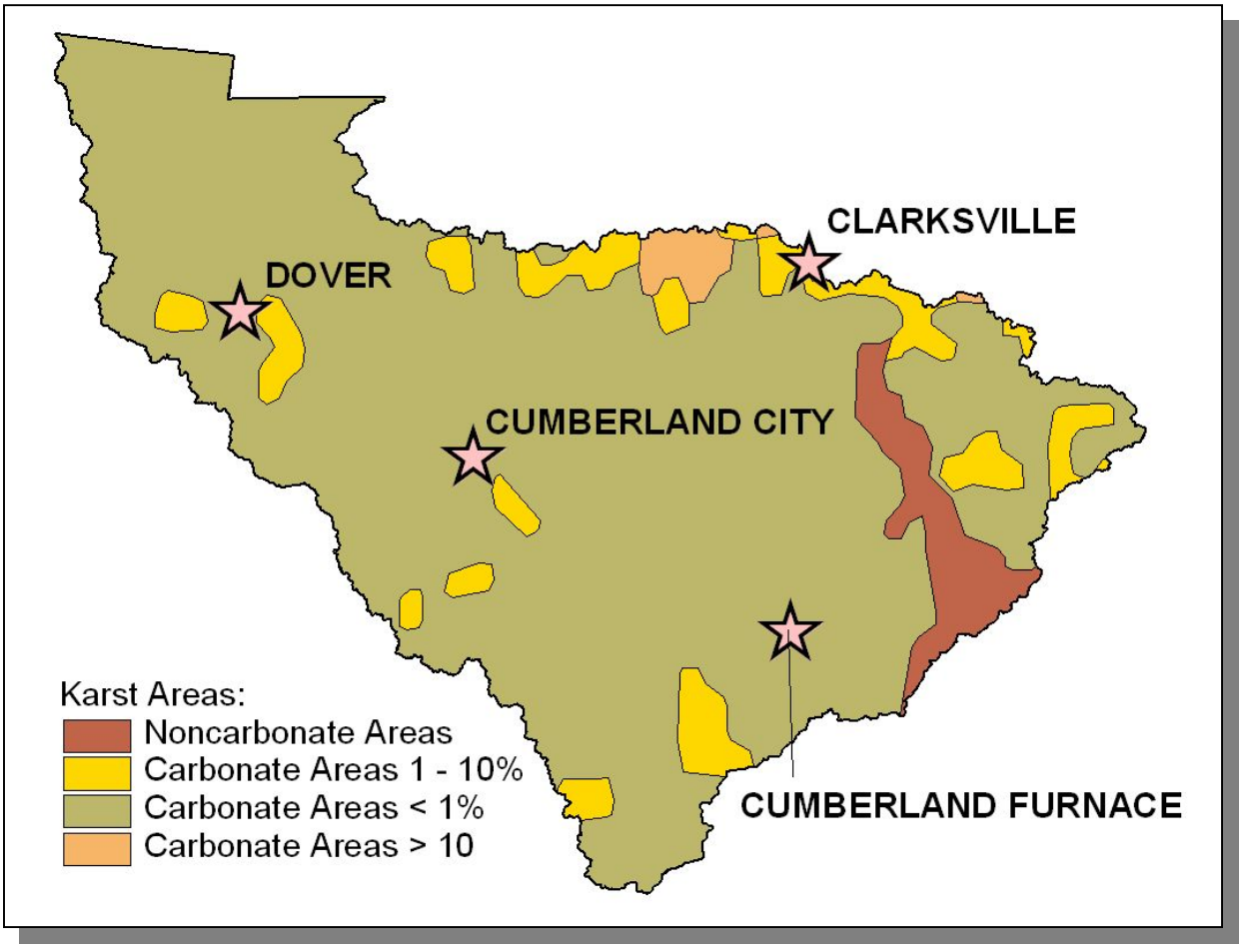

Figure 2-8. Illustration of Karst Areas in the Tennessee Portion of the Lake Barkley Watershed. *Locations of communities in the watershed are shown for reference.*

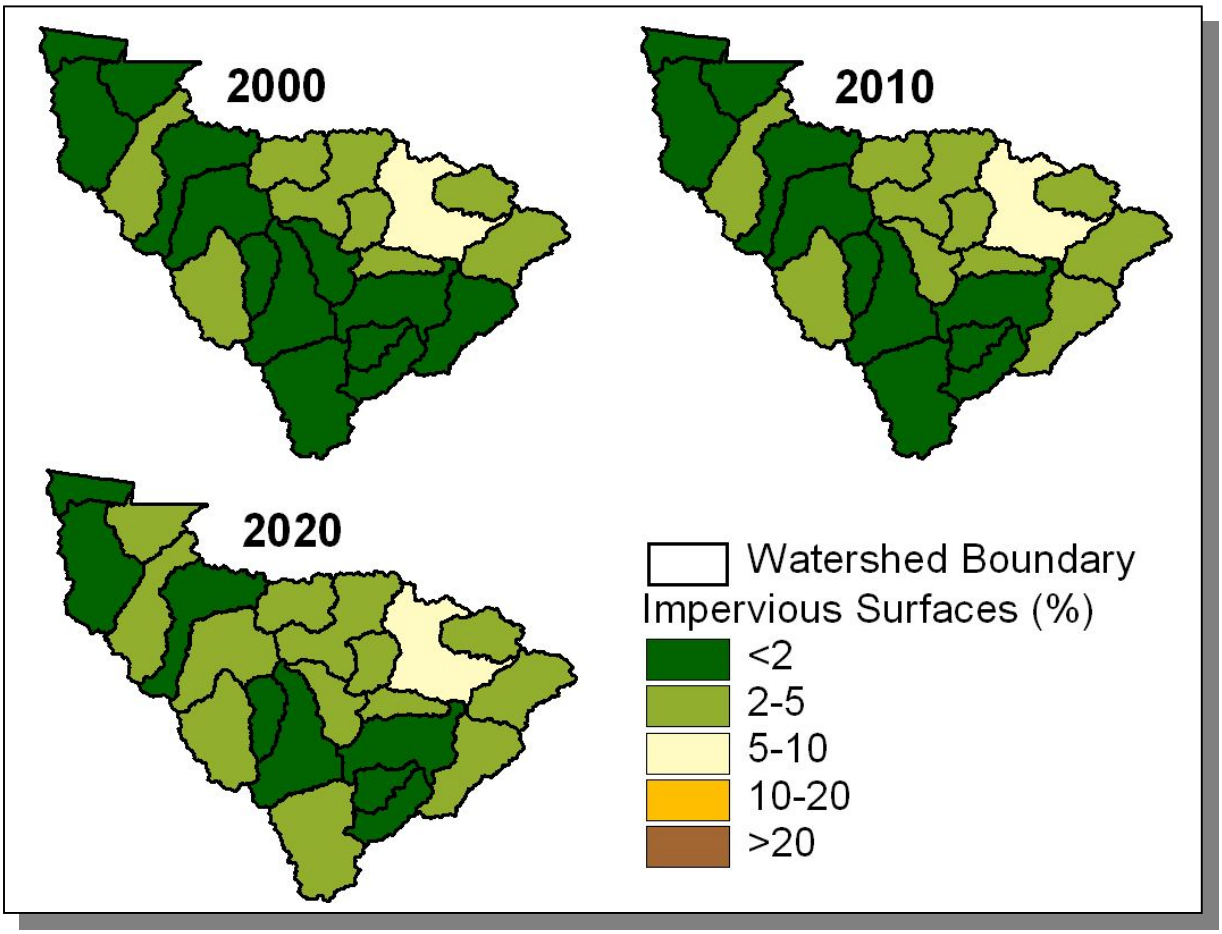

Figure 2-9. Illustration of Total Impervious Area in the Tennessee Portion of the Lake Barkley Watershed. *All HUC-12 subwatersheds are shown. Current and projected total impervious cover is provided by EPA Region 4. More information can be found at: http://www.epa.gov/ATHENS/research/impervious/*

2.5. ECOREGIONS AND REFERENCE STREAMS. Ecoregions are relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies can aid the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Tennessee Portion of the Lake Barkley Watershed lies within 1 Level III ecoregion (Interior Plateau) and contains 2 Level IV subecoregions:

- The **Western Pennyroyal Karst (71e)** is a flatter area of irregular plains, with fewer perennial streams, compared to the open hills of the Western Highland Rim (71f). Small sinkholes and depressions are common. The productive soils of this notable agricultural area are formed mostly from a thin loess mantle over residuum of Mississippian-age limestones. Most of the region is cultivated or in pasture; tobacco and livestock are the principal agricultural products, with some corn, soybeans, and small grains. The natural vegetation consisted of oak-hickory forest with mosaics of bluestem prairie. The barrens of Kentucky that extended south into Stewart, Montgomery, and Robertson counties, were once some of the largest natural grasslands in Tennessee.

- The **Western Highland Rim (71f)** is characterized by dissected, rolling terrain of open hills, with elevations of 400 to 1000 feet. The geologic base of Mississippian-age limestone, chert, and shale is covered by soils that tend to be cherty, acidic and low to moderate in fertility. Streams are characterized by coarse chert gravel and sand substrates with areas of bedrock, moderate gradients, and relatively clear water. The oak-hickory natural vegetation was mostly deforested in the mid to late 1800's, in conjunction with the iron ore related mining and smelting of the mineral limonite, but now the region is again heavily forested. Some agriculture occurs on the flatter areas between streams and in the stream and river valleys: mostly hay, pasture, and cattle, with some cultivation of corn and tobacco.

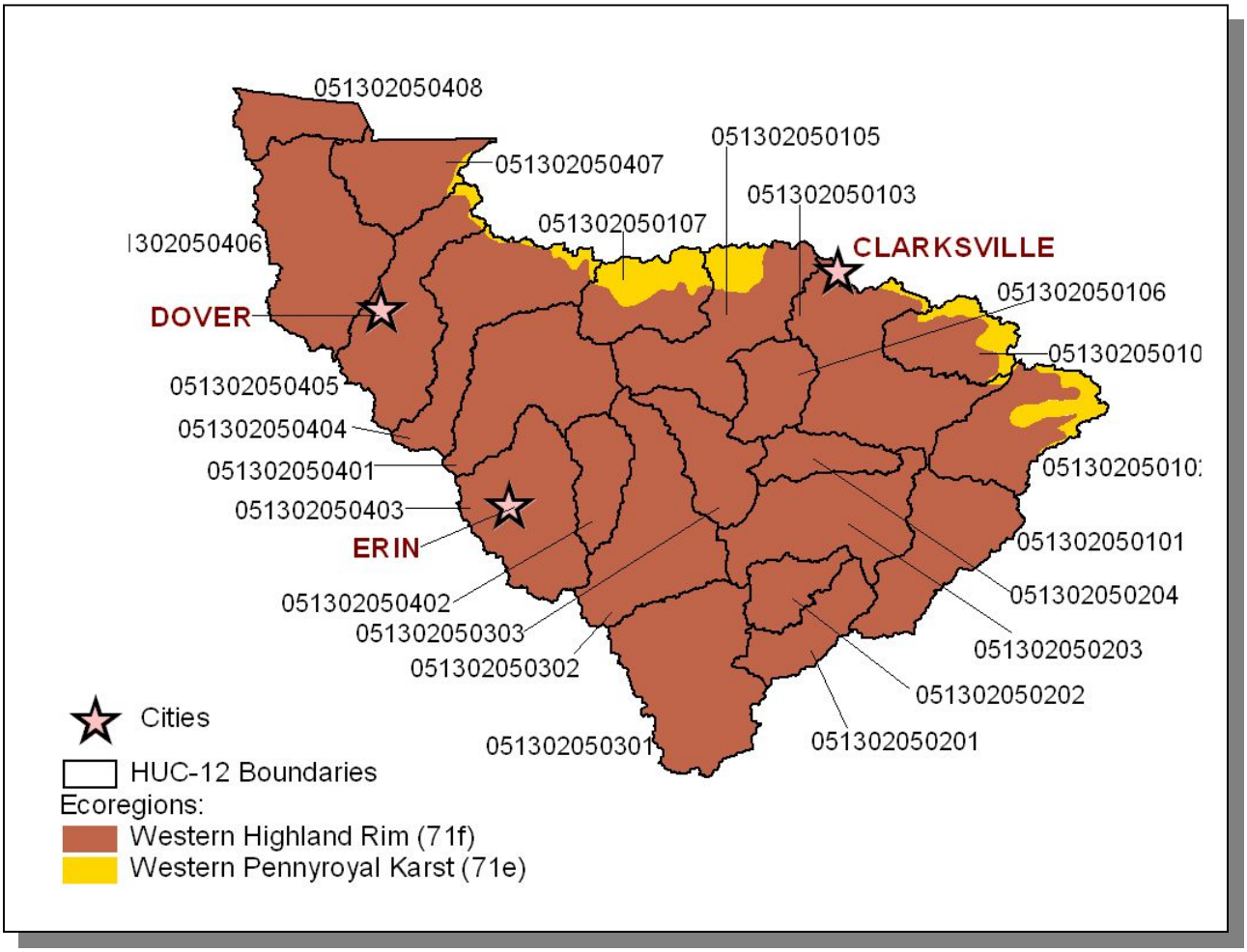

Figure 2-10. Level IV Ecoregions in the Tennessee Portion of the Lake Barkley Watershed. *HUC-12 subwatershed boundaries and locations of Clarksville, Dover, and Erin are shown for reference.*

Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition and may not be representative of a pristine condition.

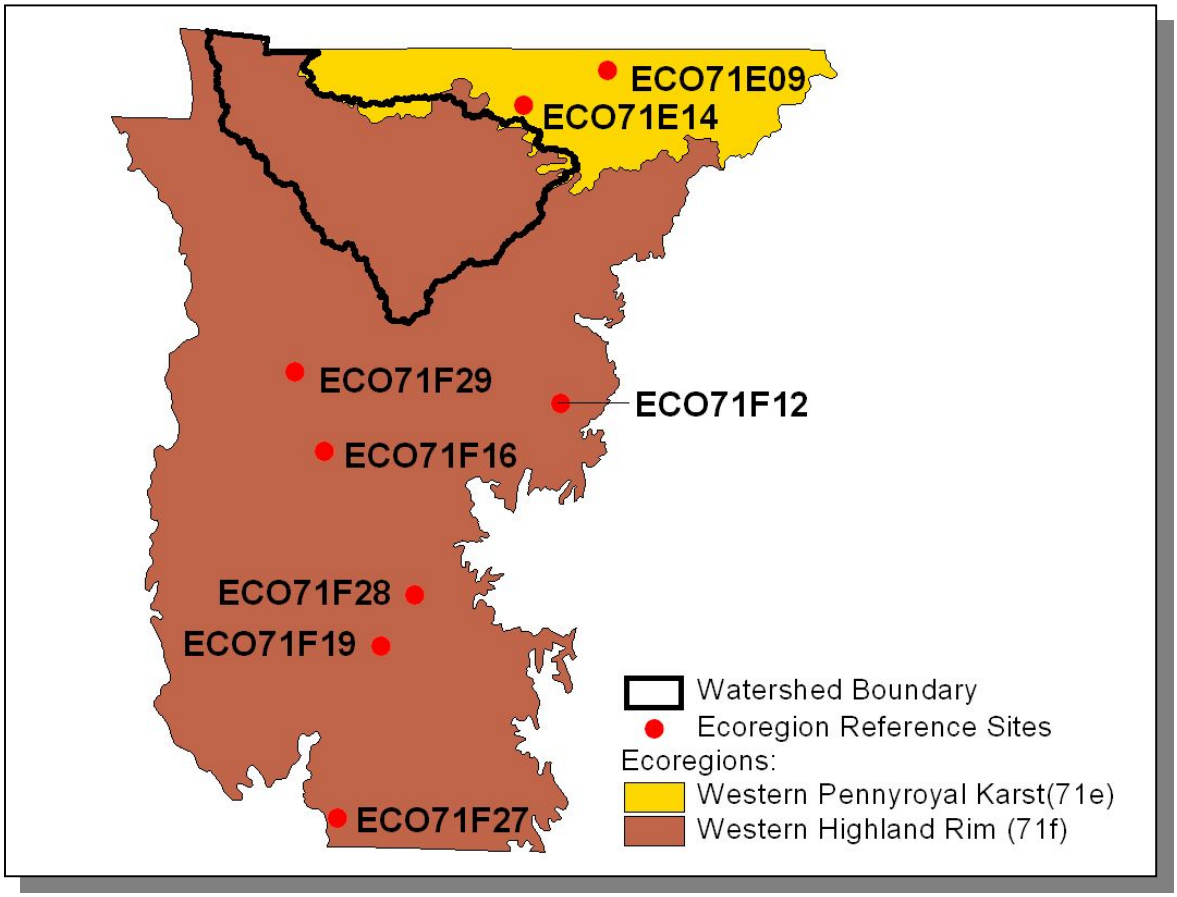

Figure 2-11. Ecoregion Monitoring Sites in Level IV Ecoregions 71e and 71f. *The Lake Barkley Watershed is shown for reference. More information, including which ecoregion reference sites were inactive or dropped prior to 06/01/2006, is provided in Appendix II.*

2.6. NATURAL RESOURCES.

2.6.A. Designated State Natural Area. The Natural Areas Program was established in 1971 with the passage of the Natural Areas Preservation Act. TDEC/Division of Natural Areas administers the State Natural Areas program. Further information may be found at http://www.state.tn.us/environment/na/.

The Tennessee Portion of the Lake Barkley Watershed has one Designated State Natural Area:

> **Barnett's Woods** is a 40-acre natural area in Montgomery County located approximately sixteen miles west of Clarksville on the Western Highland Rim. It is owned by The Nature Conservancy and was acquired in 1981. It is most significant because it supports a population of the federally listed Price's potato bean (*Apios priceana*) and because federally endangered Indiana bats (*Myotis sodalis*) have also been known to use Foster Cave (Barrnett's Cave) as a temporary roost while moving from breeding to hibernation. Barnett's Woods is also noteworthy because it is floristically diverse for its size with 443 vascular plant species present representing 95 plant families. It is a favorite place for Austin Peay State University students and faculty to botanize because of its floristic significance and close proximity to Clarksville.

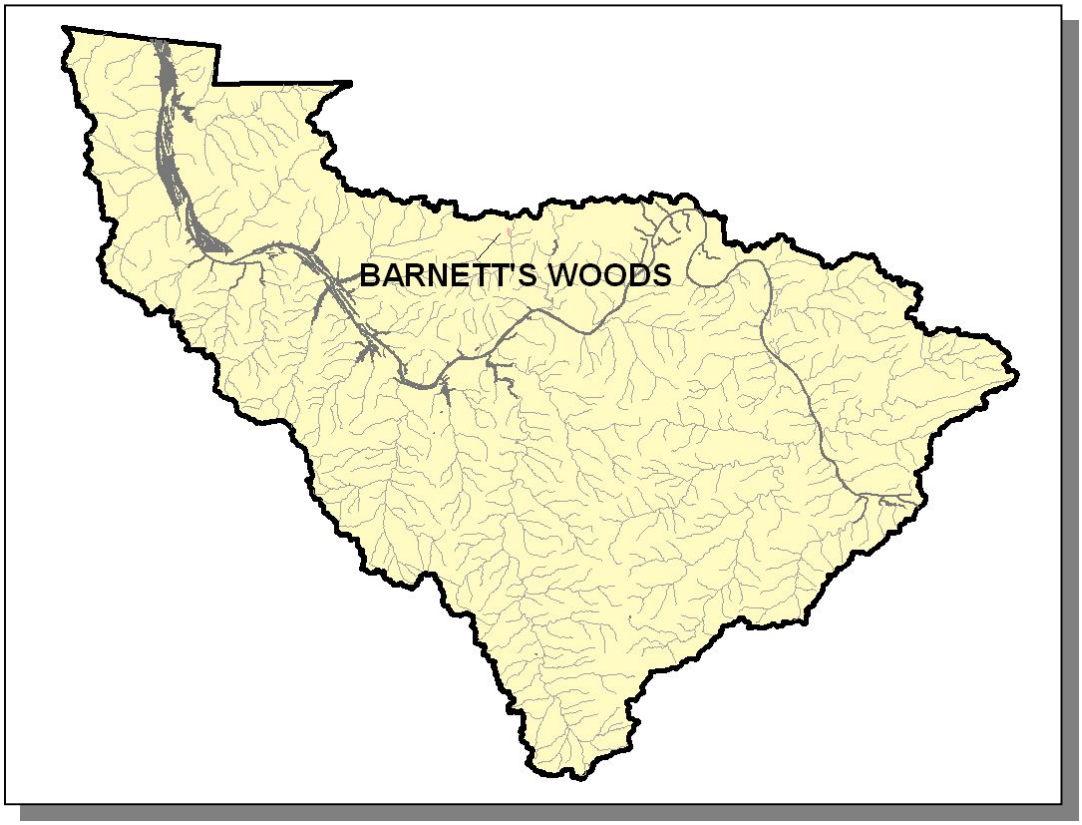

Figure 2-12. There is One Designated State Natural Area in the Tennessee Portion of the Lake Barkley Watershed.

2.6.B. Rare Plants and Animals. The Heritage Program in the TDEC Division of Natural Areas maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the federal Endangered Species Act.

GROUPING	NUMBER OF RARE SPECIES
Crustaceans	2
Insects	5
Mussels	0
Snails	1
Other	0
Amphibians	1
Birds	6
Fish	2
Mammals	6
Reptiles	5
Plants	44
Total	**72**

Table 2-3. There are 72 Known Rare Plant and Animal Species in the Tennessee Portion of the Lake Barkley Watershed.

In the Tennessee Portion of the Lake Barkley Watershed, there are one known rare amphibian species, two known rare crustacean species, two known rare fish species, and one known rare reptile species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Cryptobranchus alleganiensis	Hellbender		D
Cambarus brachydactylus	Crayfish		
Orconectes pellucidus	Eyeless Crayfish		
Cycleptus elongatus	Blue Sucker		T
Typhlichthys subterraneus	Southern Cavefish		D
Macroclemys temminckii	Alligator Snapping Turtle		D

Table 2-4. Rare Aquatic Species in the Tennessee Portion of the Lake Barkley Watershed. *Federal Status: LE, Listed Endangered by the U.S. Fish and Wildlife Service. State Status: T, Listed Threatened by the Tennessee Wildlife Resources Agency; E, Listed Endangered by the Tennessee Wildlife Resources Agency; D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency. More information may be found at http://www.state.tn.us/environment/na/.*

2.6.C. Wetlands. The Division of Natural Areas maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at:

http://www.state.tn.us/environment/na/wetlands/

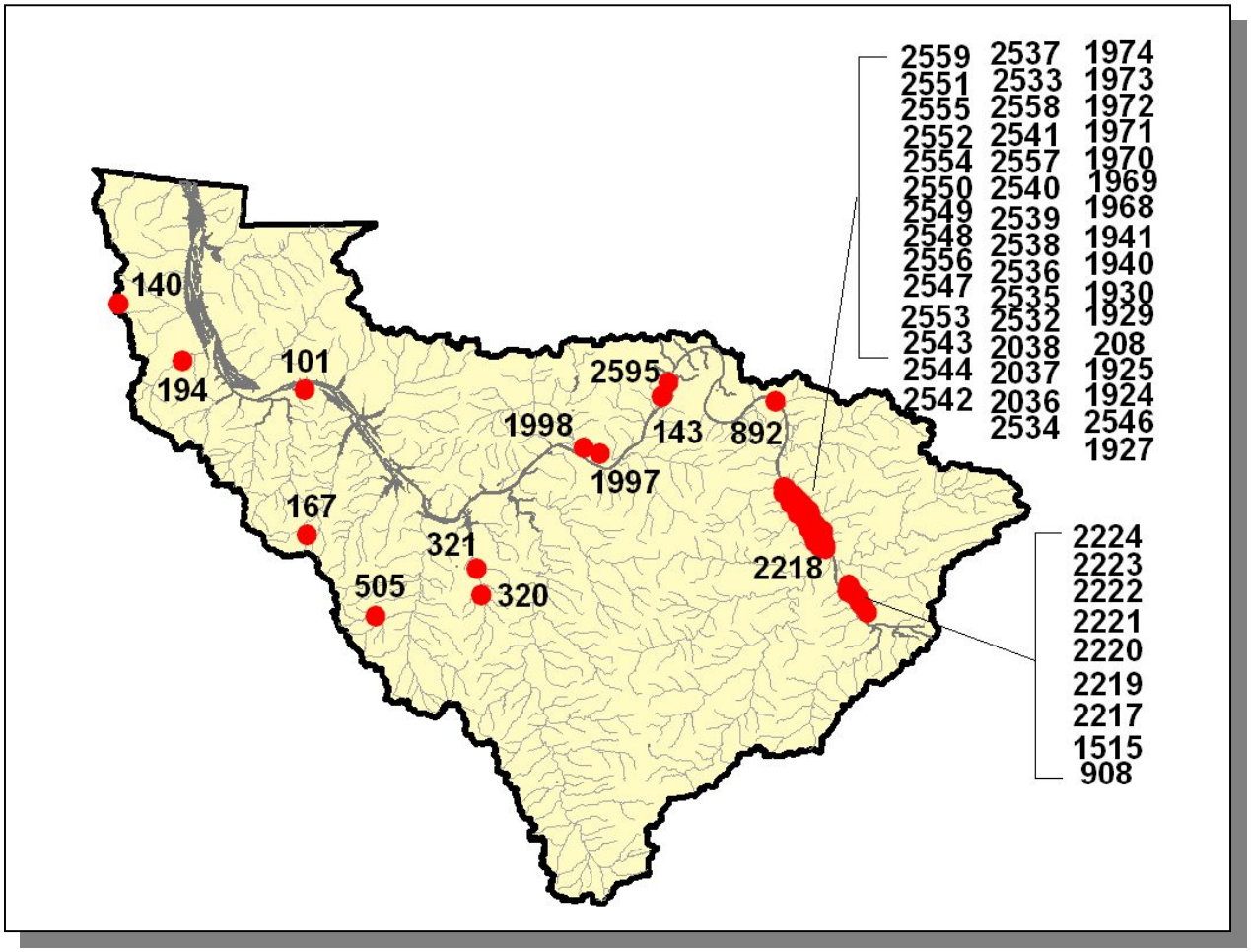

Figure 2-13. Location of Wetland Sites in TDEC Division of Natural Areas Database in the Tennessee Portion of the Lake Barkley Watershed. This map represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands. *There may be additional wetland sites in the watershed. More information, including identification of wetland sites labeled, is provided in Appendix II.*

2.7. CULTURAL RESOURCES.

2.7.A. Nationwide Rivers Inventory. The Nationwide Rivers Inventory, required under the Federal Wild and Scenic Rivers Act of 1968, is a listing of free-flowing rivers that are believed to possess one or more outstanding natural or cultural values. Exceptional scenery, fishing or boating, unusual geologic formations, rare plant and animal life, cultural or historic artifacts that are judged to be of more than local or regional significance are the values that qualify a river segment for listing. The Tennessee Department of Environment and Conservation and the Rivers and Trails Conservation Assistance branch of the National Park Service jointly compile the Nationwide Rivers Inventory from time to time (most recently in 1997). Under a 1980 directive from the President's Council on Environmental Quality, all Federal agencies must seek to avoid or mitigate actions that would have an adverse effect on Nationwide Rivers Inventory segments.

The most recent version of the Nationwide Rivers Inventory lists portions of two streams in the Tennessee Portion of the Lake Barkley Watershed:

Long Creek (RM 0 to RM 10) is a scenic stream that supports game fishery.

Yellow Creek (RM 5 to RM 13) is a scenic and recreational stream that supports game fishery.

RIVER	SCENIC	RECREATION	GEOLOGIC	FISH	WILDLIFE	HISTORIC	CULTURAL
Long Creek	X	X		X			
Yellow Creek	X	X		X			

Table 2-5. Attributes of Streams Listed in the Nationwide Rivers Inventory.

Additional information may be found online at http://www.ncrc.nps.gov/rtca/nri/

2.7.B. Public Lands. Some sites representative of the cultural heritage are under state or federal protection:

- Barkley Wildlife Management Area is managed by the Tennessee Wildlife Resources Agency (TWRA). More information may be found at: http://www.state.tn.us/twra/

- Bumpus Mills Marina and Recreation Area is managed by the U.S. Army Corps of Engineers (USACOE). More information may be found at: http://www.lrn.usace.army.mil/op/bar/rec/marinas.htm

- Cheatham Reservoir Wildlife Management Area is a 1,988-acre tract on the Cheatham Reervoir and is managed by the TWRA. More information may be found at: http://www.state.tn.us/twra/gis/region2maps.html

- Cross Creeks National Wildlife Refuge is an 8,862-acre site along the Cumberland River in Stewart County, Tennessee. More information may be found at: http://www.fws.gov/crosscreeks/

- Dyers Creek Recreation Area is an 87-acre site managed by the USACOE. It is located on Lake Barkley in Montgomery County, Tennessee. More information may be found at: http://www.lrn.usace.army.mil/op/bar/rec/recreation.htm

- Fort Campbell Military Reservation & WMA's 85,000 acres are managed by the U.S. Army and are located in both Tennessee and Kentucky. More information may be found at: http://www.kdfwr.state.ky.us/kfwis/arcims/wma.asp?strID=9076

- Fort Donelson National Military Park memorializes a key Civil War battle in 1862, and comprises 572-acres. More information may be found at: http://www.explorekentuckylake.com/stewart/attractions/attractions.htm

- Guices Creek Recreation Area is a 230-acre site managed by the U.S. Army Corps of Engineers (USACOE). It is located on Lake Barkley in Montgomery County, Tennessee. More information may be found at: http://www.lrn.usace.army.mil/op/bar/rec/recreation.htm

- Haynes Bottom Wildlife Management Area is managed by the TWRA and is located in Montgomery County. More information may be found at: http://state.tn.us/twra/

- Hickman Creek Recreation Area is a 251-acre site managed by the U.S. Army Corps of Engineers (USACOE). It is located on Lake Barkley in Montgomery County, Tennessee. More information may be found at: http://www.lrn.usace.army.mil/op/bar/rec/recreation.htm

- Land Between The Lakes Wildlife Management Area is a 170,000-acre site managed by the U.S. Forest Service (USFS). More information may be found at: http://www.lbl.org/AboutLBL.html

- Lick Creek Recreation Area is a 58-acre parcel of land managed by the U.S. Army Corp of Engineers and is located in Stewart County.

- Long Pond Wildlife Management Area is a 24-acre parcel of land managed by TWRA. More information may be found at: http://state.tn.us/twra/

- Pardue Pond Refuge and Dyson Ditch Refuge comprise 736 acres and are managed by TWRA. More information may be found at: http://www.state.tn.us/twra/

- River's Bend Recreation Area is an 84-acre site managed by the U.S. Army Corp of Engineers and is located in Stewart County.

- Saline Creek Access Area is a 72-acre site managed by the U.S. Army Corps of Engineers (USACOE). It is located on Lake Barkley in Montgomery County, Tennessee. More information may be found at: http://www.lrn.usace.army.mil/op/bar/rec/recreation.htm

- Shelton Ferry Wildlife Management area is located in Montgomery County and consists of 628 acres. It is managed by the TWRA. More information may be found at: http://www.state.tn.us/twra/

- Stewart State Forest is a 4,277-acre forest located in Stewart County, Tennessee and managed by the Tennessee Department of Agriculture, Division of Forestry. More information may be found at: http://www.state.tn.us/agriculture/forestry/stateforests/3.html

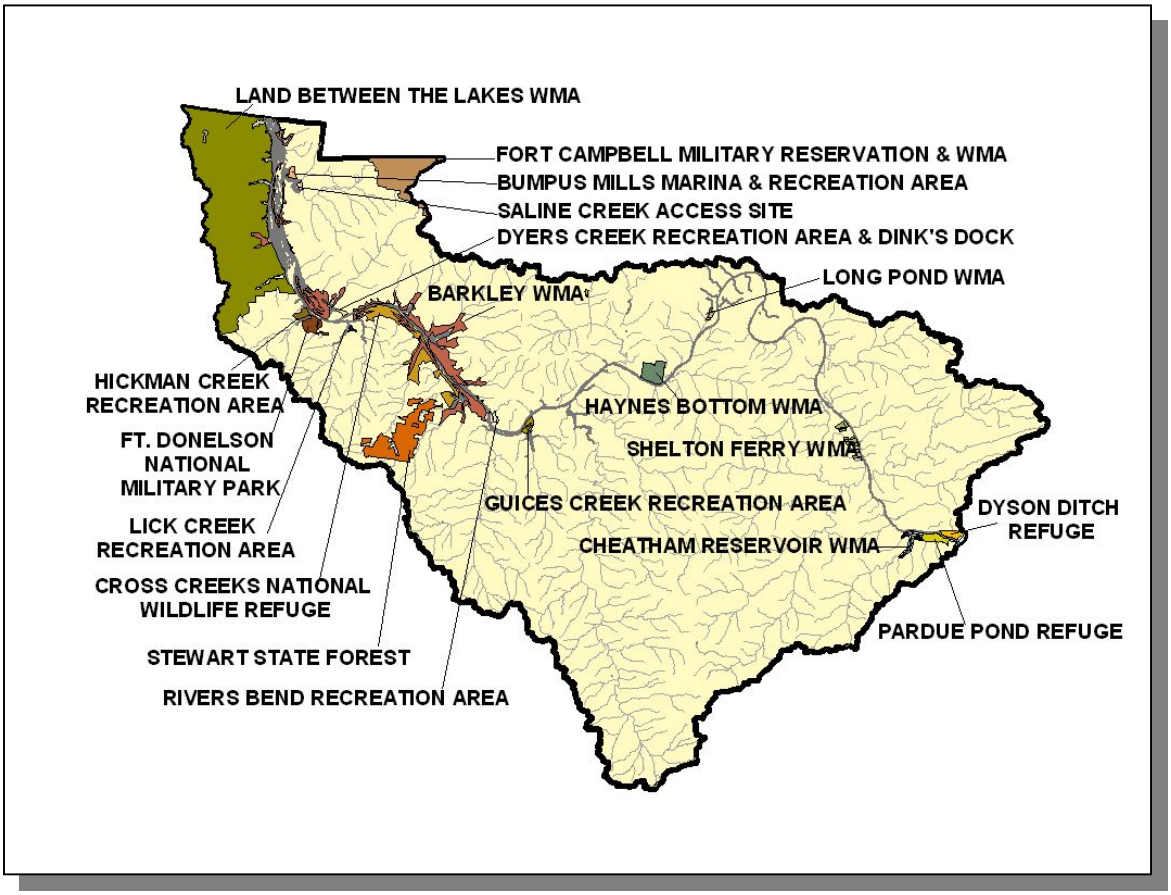

Figure 2-15. Public Lands in the Tennessee River Portion of the Lake Barkley River Watershed. *Data are from Tennessee Wildlife Resources Agency. WMA, Wildlife Management Area.*

2.8. TENNESSEE RIVERS ASSESSMENT PROJECT. The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

http://www.state.tn.us/environment/wpc/publications/riv/

STREAM	NSQ	RB	RF	STREAM	NSQ	RB	RF
Bartee Branch Creek	4			Honey Fork Creek	3		
Bear Creek	1			Johnson Creek	2	2	
Big Bartons Creek	1,2,3			Leatherwood Creek	3		
Big Elk Creek	2			Lee Creek		2	
Big McAdoo Creek	3			Lick Creek		3	
Blooming Grove Creek	2			Little Bartons Creek	2		
Budds Creek	4			Little McAdoo Creek	3		
Cumberland River	2,3	1,2		Long Creek	2		
Dry Fork Creek		2	1	Louise Creek	2		2
Dyers Creek	3		2	North Cross Creek	2		
East Fork Creek	2			Racoon Creek			
Furnace Creek	2			Saline Creek	3		2
Guices Creek	3			South Cross Creek	2		3
Half Pone Creek	3			Wells Creek	3		3
Hayes Fork Creek	3			Yellow Creek	3	2	1,2

Table 2-6. Tennessee Rivers Assessment Project Stream Scoring in the Lake Barkley Watershed.

Categories: NSQ, Natural and Scenic Qualities
RB, Recreational Boating
RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery
2. Regional Significance; Good Fishery
3. Local Significance; Fair Fishery
4. Not a significant Resource; Not Assessed